

**REMARKS**

**(A) STATUS OF THE APPLICATION**

Applicants thank the Examiner for clear explanation of the rejections in the Non-Final Office Action dated October 31, 2005.

**(I) DISPOSITION OF CLAIMS**

- (i) Claims 1-12 are pending in the application.
- (ii) Claims 1-4, 6, and 8-12 are rejected under 35 U.S.C. § 102(b).
- (iii) Claims 1-12 are rejected under 35 U.S.C. § 103(a).

**(II) APPLICANT'S ACTION**

- (i) Applicants have amend Claim 1.
- (ii) Applicants have canceled Claims 2, 5, 8 and 9.

**(B) RESPONSE TO REJECTION UNDER 35 U.S.C. § 102 (B)**

**(I) CLAIMS 1, 4, 6, 8-12: U.S. PATENT NO. 5,670,600 TO NIENHAUS, ET AL.**

Claims 1, 4, 6, 8-12 have been rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,670,600 to Nienhaus, *et al.* (*hereinafter* "Nienhaus"). Specifically, according to the Examiner, Nienhaus discloses an aqueous coating composition comprising a water-dilutable polyacrylate resin having an OH number of from 40 to 200 mg of KOH/g.

In fact, Nienhaus teaches acrylic copolymers having a hydroxyl value of 40–200 mg KOH/g, which do not contain polyalkylene glycol(meth)acrylate and which are prepared by polymerization in organic solvents in a two-stage process (Please see col. 7, lines 46–49, col. 8, lines 3–4). Furthermore, Nienhaus discloses using only the reaction product of (meth)acrylic acid with glycidyl esters of branched monocarboxylic acids, whereas in the present invention the unreacted components are used and needed.

Further, Applicants have also amended Claim 1 so that the OH value of its water-dilutable (meth)acrylate copolymer is now in the range of 220 to 280 mg

KOH/g instead of 200 to 280 mg KOH/g. The support for this amendment to Claim 1 is found in Claim 2 of the present patent application. Also, the acrylic resins of the present invention contain 10–40% polyalkylene glycol(meth)acrylate and are prepared by mass polymerization.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection under 35 U.S.C. § 102 (b) as anticipated by Nienhaus. Because Claims 4, 6, and 8-12 are dependent claims of Claim 1, rejection on those claims is also overcome.

(II) CLAIMS 1, 4, 6, 9-12: U.S. PATENT NO. 5,773,513 TO HUYBRECHTS, ET AL.

Claims 1, 4, 6, 9-12 have been rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,773,513 to Huybrechts, *et al.* (*hereinafter* “Huybrechts”).

However, the present invention is clearly novel over Huybrechts’ disclosure. Particularly, the acrylic copolymers of Huybrechts do not contain polyalkylene glycol (meth)acrylate. Applicants have amended Claim 1 such that the acrylic resins of the present invention contain 10–40% polyalkylene glycol(meth)acrylate. The Huybrechts copolymers are prepared by a skew feed polymerization process, wherein, in the first stage, the reaction product of a monoepoxy ester and acid monomer is used. In contrast, in the present invention the unreacted components are used and needed. Moreover, the copolymers of the instant invention are prepared by mass polymerization.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection under 35 U.S.C. § 102 (b) as anticipated by Huybrechts. Because Claims 4, 6, and 9-12 are dependent claims of Claim 1, rejection on those claims is also overcome.

(III) CLAIM 8: U.S. PATENT NO. 5,773,513 TO HUYBRECHTS, ET AL.

Claim 8 has been rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,773,513 to Huybrechts, *et al.* (*hereinafter* “Huybrechts”).

Applicants have canceled Claim 8. Limitations of Claim 8 have been incorporated in Claim 1. However, the present invention in Claim 1 is clearly novel over Huybrechts’ disclosure. Particularly, the acrylic copolymers of Huybrechts do

not contain polyalkylene glycol (meth)acrylate. Also, the Huybrechts copolymers are prepared by a skew feed polymerization process, wherein, in the first stage, the reaction product of a monoepoxy ester and acid monomer is used. In contrast, in the present invention the unreacted components are used and needed.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection of Claim 8 under 35 U.S.C. § 102 (b) as anticipated by Huybrechts.

(IV) CLAIMS 1, 4, 6, 9-12: DE 4445355 TO BREMER, ET AL.

Claims 1, 4, 6, 9-12 have been rejected under 35 U.S.C. § 102(b) as anticipated by DE 4445355 to Bremer, *et al.* (*hereinafter* "Bremer").

However, the present invention is clearly novel over Bremer disclosure. Particularly, the acrylic copolymers of Bremer have a hydroxyl value (OH number) in the range of 80–200 mg KOH/g. The present invention, with amended Claim 1, has acrylic copolymers with a hydroxyl value in the range of 220 to 280 mg KOH/g. Secondly, the copolymers of Bremer do not contain polyalkyleneglycol (meth)acrylate. On the other hand, the acrylic resins of the present invention do contain 10-40% of polyalkyleneglycol (meth)acrylate with the amendment in Claim 1. Further, the copolymers of Bremer are prepared by solution polymerization. Also, an example of an aqueous clear coat in Bremer has a content of organic solvents of about 18%. The present invention mandates a maximum organic solvent content of 10%. It should be noted that Bremer's objective is to provide binders which can be used in solvent-borne as well as aqueous coating compositions.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection under 35 U.S.C. § 102 (b) as anticipated by Bremer. Because Claims 4, 6, and 9-12 are dependent claims of Claim 1, rejection on those claims is also overcome.

(V) CLAIM 8: DE 4445355 TO BREMER, ET AL.

Claim 8 has been rejected under 35 U.S.C. § 102(b) as anticipated by DE 4445355 to Bremer, *et al.* (*hereinafter* "Bremer").

Claim 8 has been canceled and its limitation has been incorporated in Claim 1. The present invention in Claim 1 is clearly novel over Bremer's disclosure. The

product of Claim 1 is made by a mass polymerization process. Particularly, the acrylic copolymers of Bremer have a hydroxyl value (OH number) in the range of 80–200 mg KOH/g. The present invention, with amended Claim 1, has acrylic copolymers with a hydroxyl value in the range of 220 to 280 mg KOH/g. Secondly, the copolymers of Bremer do not contain polyalkyleneglycol (meth)acrylate. On the other hand, the acrylic resins of the present invention do contain 10–40% of polyalkyleneglycol (meth)acrylate with the amendment in Claim 1. Further, these copolymers are prepared by solution polymerization while the copolymers of Claim 1 are prepared by mass polymerization. Also, an example of an aqueous clear coat in Bremer has a content of organic solvents of about 18%. The present invention mandates a maximum organic solvent content of 10%. It should be noted that Bremer's objective is to provide binders which can be used in solvent-borne as well as aqueous coating compositions.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection of Claim 8 under 35 U.S.C. § 102 (b) as anticipated by Bremer.

**(C) RESPONSE TO REJECTION UNDER 35 U.S.C. § 103 (A)**

**(I) CLAIMS 1, 4, 6, 8-12: U.S. PATENT NO. 5,670,600 TO NIENHAUS, ET AL.**

Claims 1, 4, 6, 8-12 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,670,600 to Nienhaus, *et al.* (*hereinafter* "Nienhaus"). Specifically, according to the Examiner, Nienhaus discloses an aqueous coating composition comprising a water-dilutable polyacrylate resin having an OH number of from 40 to 200 mg of KOH/g.

In fact, Nienhaus teaches acrylic copolymers having a hydroxyl value of 40–200 mg KOH/g. In the Examples, the polyacrylate resins have OH numbers of 117 and 135 mg KOH/g. In addition, Applicants have also amended Claim 1 so that the OH value of its water-dilutable (meth)acrylate copolymer is now in the range of 220 to 280 mg KOH/g instead of 200 to 280 mg KOH/g. The support for this amendment to Claim 1 is found in Claim 2 of the present patent application. Applicants have also amended Claim 1 to now include polyalkylene glycol(meth)acrylate as a necessary

component of the reaction mixture. The support for this amendment is found in Claim 5, which is now canceled.

Clearly, the OH numbers claimed and/or taught by Nienhaus are much below the OH numbers for the (meth)acrylate copolymer claimed in the present invention. The higher OH numbers of the acrylic resins lead to improved compatibility with non-hydrophilic NCO's which results in a better film formation. On the other hand, it is problematic to prepare copolymers with high OH numbers by mass polymerization. It is not feasible to simply increase the OH number of a copolymer when preparing it by mass polymerization. A person skilled in the art often experiences that a requirement of a high content of hydroxyl monomers (to improve compatibility with non-hydrophilic NCO's that results in a better film formation) can lead to a removal of the OH monomers upon polymerization in the reactive diluent. But using the monomer mixture of the present invention, this problem has now been overcome.

Further, the Nienhaus resins do not contain polyalkylene glycol(meth)acrylate. With the amendment of Claim 1, the (meth)acrylates of the present invention necessarily contain polyalkyleneglycol (meth)acrylate (10-40%). Also, the Nienhaus resins are prepared by polymerization in organic solvents in a two-stage process (Please see col. 7, lines 46-49, col. 8, lines 3-4). Polymers of the present invention are prepared by mass polymerization. Furthermore Nienhaus discloses using only the reaction product of (meth)acrylic acid with glycidyl esters of branched monocarboxylic acids, whereas in the present invention the unreacted components are used and needed.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection under 35 U.S.C. § 103 (a) as obvious over by Nienhaus. Because Claims 4, 6, and 8-12 are dependent claims of Claim 1, rejection on those claims is also overcome.

(II) CLAIMS 2, 3: U.S. PATENT NO. 5,670,600 TO NIENHAUS, ET AL.

Claims 2 and 3 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,670,600 to Nienhaus, *et al.* (*hereinafter* "Nienhaus"). Specifically, according to the Examiner, Nienhaus discloses an aqueous coating composition comprising a water-dilutable polyacrylate resin having an OH number of from 40 to 200 mg of KOH/g. Also, the Examiner erroneously states that the OH number range

for Claims 2 and 3 is from 22 to 280 mg of KOH/g. Applicants respectfully point out that the OH number range for Claims 2 and 3 before amendment was 220 to 280 and 240 to 270 mg KOH/g.

Applicants have canceled Claim 2. The OH number range of Claim 2 has been incorporated as an amendment in Claim 1. Applicants have also amended Claim 1 to now include polyalkylene glycol(meth)acrylate as a necessary component of the reaction mixture. The support for this amendment is found in Claim 5, which is now canceled.

With respect to Nienhaus, Applicants submit that Nienhaus teaches acrylic copolymers having a hydroxyl value of 40–200 mg KOH/g. In the Examples, the polyacrylate resins have OH numbers of 117 and 135 mg KOH/g.

Clearly, the OH numbers claimed and/or taught by Nienhaus are much below the OH numbers for the (meth)acrylate copolymer claimed in the present invention. The higher OH numbers of the acrylic resins lead to improved compatibility with non-hydrophilic NCO's which results in a better film formation. On the other hand, it is problematic to prepare copolymers with high OH numbers by mass polymerization. It is not feasible to simply increase the OH number of a copolymer when preparing it by mass polymerization. A person skilled in the art often experiences that a requirement of a high content of hydroxyl monomers (to improve compatibility with non-hydrophilic NCO's that results in a better film formation) can lead to a removal of the OH monomers upon polymerization in the reactive diluent. But using the monomer mixture of the present invention, this problem has now been overcome.

Also, polymers of the present invention are prepared by mass polymerization. In contrast, the Nienhaus resins are prepared by polymerization in organic solvents in a two-stage process (Please see col. 7, lines 46–49, col. 8, lines 3–4). Furthermore, Nienhaus discloses using only the reaction product of (meth)acrylic acid with glycidyl esters of branched monocarboxylic acids, whereas in the present invention the unreacted components are used and needed.

Furthermore, Section 2142 of the MPEP indicates that a *prima facie* case of obviousness is established only when:

- (1) all of the claim limitations are either taught, or suggested by the cited prior art;

- (2) there is some suggestion or motivation to modify or combine the cited prior art references; AND
- (3) there is a reasonable expectation of successfully producing the claimed invention via such a combination.

Neither the first, nor the second prong of the obviousness inquiry is satisfied by Nienhaus. Specifically, Nienhaus does not teach the higher range of the OH number either by claiming it or by enabling it in examples. Also, the second prong of the obviousness inquiry states that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings (See *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002)). Nienhaus does not state that an OH number higher than 200 can be used. Therefore, Applicants respectfully submit that because the second prong of the obviousness inquiry is not satisfied by the Examiner's assertion, a *prima facie* case of obviousness is not established.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection under 35 U.S.C. § 103 (a) as obvious over Nienhaus.

(III) CLAIMS 5 AND 7: U.S. PATENT NO. 5,670,600 TO NIENHAUS, ET AL. IN VIEW OF U.S. PATENT NO. 5,157,069 TO CAMPBELL

Claims 5 and 7 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,670,600 to Nienhaus, *et al.* (*hereinafter* "Nienhaus") in view of U.S. Patent 5,157,069 to Campbell (*hereinafter* "Campbell").

Applicants have canceled Claim 5 and its limitations are now incorporated in Claim 1.

The Applicants respectfully disagree with the Examiner's reasoning of obviousness under 35 U.S.C. § 103(a) with reference to Nienhaus and Campbell.

Applicants respectfully submit that the first prong of the obviousness inquiry is not satisfied. Nienhaus teaches acrylic copolymers having a hydroxyl value of 40–200 mg KOH/g. In the Examples, the polyacrylate resins have OH numbers of 117 and 135 mg KOH/g. In addition, Applicants have also amended Claim 1 so that the OH value of its water-dilutable (meth)acrylate copolymer is now in the range of 220 to 280 mg KOH/g instead of 200 to 280 mg KOH/g. The support for this amendment to Claim 1 is found in Claim 2 of the present patent application. Applicants have also

amended Claim 1 to now include polyalkylene glycol(meth)acrylate as a necessary component of the reaction mixture. The support for this amendment is found in Claim 5, which is now canceled. The Examiner acknowledges that the prior art does not disclose the use of polyalkyleneglycol (meth)acrylates copolymerizable monomer.

Clearly, the OH numbers claimed and/or taught by Nienhaus are much below the OH numbers for the (meth)acrylate copolymer claimed in the present invention. The higher OH numbers of the acrylic resins lead to improved compatibility with non-hydrophilic NCO's which results in a better film formation. On the other hand, it is problematic to prepare copolymers with high OH numbers by mass polymerization. It is not feasible to simply increase the OH number of a copolymer when preparing it by mass polymerization. A person skilled in the art often experiences that a requirement of a high content of hydroxyl monomers (to improve compatibility with non-hydrophilic NCO's that results in a better film formation) can lead to a removal of the OH monomers upon polymerization in the reactive diluent. But using the monomer mixture of the present invention, this problem has now been overcome.

Further, the Nienhaus resins do not contain polyalkylene glycol(meth)acrylate. With the amendment of Claim 1, the (meth)acrylates of the present invention necessarily contain polyalkyleneglycol (meth)acrylate (10-40%). Also, the Nienhaus resins are prepared by polymerization in organic solvents in a two-stage process (Please see col. 7, lines 46 – 49, col. 8, lines 3 – 4). Polymers of the present invention are prepared by mass polymerization. Furthermore Nienhaus discloses using only the reaction product of (meth)acrylic acid with glycidyl esters of branched monocarboxylic acids, whereas in the present invention the unreacted components are used and needed.

The second prong of the obviousness inquiry states that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings (See *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002)). Applicants respectfully submit that because the second prong of the obviousness inquiry is not satisfied by the Examiner's assertion, a *prima facie* case of obviousness is not established.



According to the Examiner, Nienhaus concerns cross-linkable aqueous compositions comprising hydroxyl-functional acrylic monomers. Campbell, according to the Examiner, has recognized the equivalence of various hydroxylated acrylic monomers. Also, according to the Examiner, Campbell is in an analogous field of art and discloses the use of cross-linkable hydroxyl groups that may be derived from hydroxyethyl (meth)acrylate, hydroxybutyl (meth)acrylate, polyethylene glycol mono(meth)acrylate or polypropylene glycol mono(meth)acrylate. Thus, according to the Examiner, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include polyacrylate resins comprising a combination of hydroxyl functional acrylic monomers, including those claimed by the instant invention, in the coating composition of Nienhaus and thereby obtain the instant invention, absent a showing of unexpected results.

Applicants disagree with the Examiner's assertions above. Campbell teaches the use of *non-ionic* dispersions of acrylic resins to avoid instability of the coating composition in the presence of acids and bases and to avoid interference with the cure of melamine crosslinkers (col. 1, lines 48–51). In fact, Campbell differentiates its invention from anionic dispersions of its prior art (See col. 1, lines 40-51).<sup>1</sup> The acrylic resins of Campbell are free of carboxyl groups. Also, there is no indication to use polyalkylene glycol(meth)acrylate in *anionic acrylic resins* to improve the compatibility with non-hydrophilic polyisocyanates. In other words, there is no motivation or suggestion to combine Nienhaus with Campbell.

Therefore, Applicants respectfully submit that the Examiner has not met his burden of proof in establishing a *prima facie* case of obviousness.

(IV) CLAIM 8: U.S. PATENT NO. 5,773,513 TO HUYBRECHTS, ET AL.

Claim 8 has been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,773,513 to Huybrechts, *et al.* (*hereinafter* "Huybrechts").

As mentioned previously, the present invention is clearly novel over Huybrechts' disclosure. Particularly, the acrylic copolymers of Huybrechts do not

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<sup>1</sup> Campbell states that-

"Addition of acids, such as those used to produce lower temperature curing melamine systems, results in flocculation or coagulation of the anionically stabilized resin. Exposure of the anionically stabilized basecoats to polyvalent cations, such as those be released from corrosion of steel, also result in flocculation or coagulation of the anionically stabilized resin.

An object of the present invention is to provide an aqueous coating composition which is stable in the presence of acids and bases and which does not interfere with the cure of crosslinkers like melamine."

contain polyalkylene glycol (meth)acrylate. Applicants have also amended Claim 1 (Claim 8 is a dependent claim of Claim 1) to contain a limitation that the copolymerization is a mass polymerization. The Huybrechts copolymers are prepared by a skew feed polymerization process, wherein, in the first stage, the reaction product of a monoepoxy ester and acid monomer is used. In contrast, in the present invention the unreacted components are used and needed and the copolymerization is a mass polymerization.

Further, the range of hydroxyl number (30-250) in Huybrechts, although overlapping with the range in present invention (200-280 and an amended range of 220-280 mg KOH/g), examples of the present invention (comparative Examples 6, 7, and 8; a rating of "very cloudy-matt film")) show that clear coats with lower OH number, e.g., about 150, have very poor film formation. Further, Huybrechts does not address the problem of compatibility with non-hydrophilic NCO's. Even the examples show results only with melamine crosslinkers.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection of Claim 8 under 35 U.S.C. § 103 (a) as obvious over Huybrechts.

(V) CLAIMS 5 AND 7: U.S. PATENT NO. 5,773,513 TO HUYBRECHTS, ET AL. IN VIEW OF U.S. PATENT NO. 5,157,069 TO CAMPBELL

Claims 5 and 7 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5773,513 to Huybrechts, *et al.* (*hereinafter* "Huybrechts") in view of U.S. Patent 5,157,069 to Campbell (*hereinafter* "Campbell").

Applicants have canceled Claim 5 and its limitations are now incorporated in Claim 1.

Applicants respectfully disagree with the Examiner's reasoning of obviousness under 35 U.S.C. § 103(a) with reference to Huybrechts and Campbell.

Applicants respectfully submit that the first prong of the obviousness inquiry is not satisfied. Applicants have also amended Claim 1 to now include polyalkylene glycol(meth)acrylate as a necessary component of the reaction mixture. The support for this amendment is found in Claim 5, which is now canceled. The Examiner acknowledges that the prior art does not disclose the use of polyalkyleneglycol (meth)acrylates copolymerizable monomer. Secondly, the Huybrechts resins are prepared by skewed polymerization process wherein in the first stage the reaction

product of a monoepoxy ester and acid monomer is used. In contrast, polymers of the present invention are prepared by mass polymerization.

The second prong of the obviousness inquiry states that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings (See *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002)). Applicants respectfully submit that because the second prong of the obviousness inquiry is not satisfied by the Examiner's assertion, a *prima facie* case of obviousness is not established.

According to the Examiner, Huybrechts concerns cross-linkable aqueous compositions comprising hydroxyl-functional acrylic monomers. Campbell, according to the Examiner, has recognized the equivalence of various hydroxylated acrylic monomers. Also, according to the Examiner, Campbell is in an analogous field of art and discloses the use of cross-linkable hydroxyl groups that may be derived from hydroxyethyl (meth)acrylate, hydroxybutyl (meth)acrylate, polyethylene glycol mono(meth)acrylate or polypropylene glycol mono(meth)acrylate. Thus, according to the Examiner, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include polyacrylate resins comprising a combination of hydroxyl functional acrylic monomers, including those claimed by the instant invention, in the coating composition of Huybrechts and thereby obtain the instant invention, absent a showing of unexpected results.

Applicants disagree with the Examiner's assertions above. Campbell teaches the use of *non-ionic* dispersions of acrylic resins to avoid instability of the coating composition in the presence of acids and bases and to avoid interference with the cure of melamine crosslinkers (col. 1, lines 48–51). In fact, Campbell differentiates its invention from anionic dispersions of its prior art (See col. 1, lines 40-51).<sup>2</sup> The acrylic resins of Campbell are free of carboxyl groups. Also, there is no indication to use polyalkylene glycol(meth)acrylate in *anionic acrylic resins* to improve the compatibility with non-hydrophilic polyisocyanates. In other words there is no motivation or suggestion to combine Huybrechts with Campbell.

Further, the range of hydroxyl number (30-250) in Huybrechts, although overlapping with the range in present invention (200-280 and an amended range of

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<sup>2</sup> See footnote 1, *supra*.

220-280 mg KOH/g), examples of the present invention (comparative Examples 6, 7, and 8; a rating of "very cloudy-matt film") show that clear coats with lower OH number, e.g., about 150, have very poor film formation. Further, Huybrechts does not address the problem of compatibility with non-hydrophilic NCOs. Even the examples show results only with melamine crosslinkers.

Therefore, Applicants respectfully submit that the Examiner has not met his burden of proof in establishing a *prima facie* case of obviousness.

(VI) CLAIMS 2, 3: DE 4445355 TO BREMER, ET AL.

Claims 2 and 3 have been rejected under 35 U.S.C. § 103(a) as obvious over DE 4445355 to Bremer, *et al.* (*hereinafter* "Bremer").

Applicants have canceled Claim 2. The OH number range of Claim 2 has been incorporated as an amendment in Claim 1. Applicants have also amended Claim 1 to now include polyalkylene glycol(meth)acrylate as a necessary component of the reaction mixture. The support for this amendment is found in Claim 5, which is now canceled.

With respect to Bremer, Applicants submit that Bremer teaches acrylic copolymers having OH numbers of 80–200 mg KOH/g. The present invention in Claim 3, which is a dependent claim of Claim 1, teaches acrylic copolymers having OH numbers of 240-270 mg KOH/g. Clearly, the OH numbers taught by Bremer are much below the OH numbers for the (meth)acrylate copolymer claimed in the present invention. The higher OH numbers of the acrylic resins lead to improved compatibility with non-hydrophilic NCO's which results in a better film formation. On the other hand, it is problematic to prepare copolymers with high OH numbers by mass polymerization. It is not feasible to simply increase the OH number of a copolymer when preparing it by mass polymerization. A person skilled in the art often experiences that a requirement of a high content of hydroxyl monomers (to improve compatibility with non-hydrophilic NCO's that results in a better film formation) can lead to a removal of the OH monomers upon polymerization in the reactive diluent. But using the monomer mixture of the present invention, this problem has now been overcome.

Further, the Bremer copolymers do not contain polyalkyleneglycol (meth)acrylate. On the other hand, the copolymers of the present invention in Claim

3 do contain polyalkyleneglycol (meth)acrylate. The Bremer copolymers are prepared by solution polymerization. The copolymers of the present invention in Claim 3 are prepared by mass polymerization. In addition, the example of an aqueous clear coat in Bremer has a content of organic solvents of about 18%. The maximum organic solvent content of the copolymers embodied in Claim 3 of the present invention is 10%. The objective of Bremer is to provide binders which can be used in solvent-borne as well as aqueous coating compositions. The instant invention relates to aqueous two-component coating compositions for automotive and industrial coatings based on hydroxy-functional acrylate copolymers and polyisocyanate cross-linking agents.

Neither the first, nor the second prong of the obviousness inquiry is satisfied by Nienhaus. Specifically, Bremer does not teach the higher range of the OH number either by claiming it or by enabling it in examples. Also, the second prong of the obviousness inquiry states that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings (See *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002)). Bremer does not state that an OH number higher than 200 and particularly in the range of 240-270 can be used. Applicants respectfully submit that because the second prong of the obviousness inquiry is not satisfied by the Examiner's assertion, a *prima facie* case of obviousness is not established.

Because of the above reasons Applicants respectfully believe that they have overcome the rejection under 35 U.S.C. § 103 (a) as obvious over Bremer.

(VII) CLAIMS 5 AND 7: DE 4445355 TO BREMER, ET AL. IN VIEW OF U.S. PATENT NO. 5,157,069 TO CAMPBELL

Claims 5 and 7 have been rejected under 35 U.S.C. § 103(a) as obvious over DE 4445355 to Bremer, *et al.* (hereinafter "Bremer") in view of U.S. Patent 5,157,069 to Campbell (*hereinafter* "Campbell").

Applicants have canceled Claim 5 and its limitations are now incorporated in Claim 1.

Applicants respectfully disagree with the Examiner's reasoning of obviousness under 35 U.S.C. § 103(a) with reference to Bremer and Campbell.

Applicants respectfully submit that the first prong of the obviousness inquiry is not satisfied. Bremer teaches acrylic copolymers having a hydroxyl value of 80–200 mg KOH/g. In addition, Applicants have also amended Claim 1 so that the OH value of its water-dilutable (meth)acrylate copolymer is now in the range of 220 to 280 mg KOH/g instead of 200 to 280 mg KOH/g. The support for this amendment to Claim 1 is found in Claim 2 of the present patent application. Applicants have also amended Claim 1 to now include polyalkylene glycol(meth)acrylate as a necessary component of the reaction mixture. The support for this amendment is found in Claim 5, which is now canceled. The Examiner acknowledges that the prior art does not disclose the use of polyalkyleneglycol (meth)acrylates copolymerizable monomer.

Clearly, the OH numbers taught by Bremer are much below the OH numbers for the (meth)acrylate copolymer claimed in the present invention. Further, the Bremer resins do not contain polyalkylene glycol(meth)acrylate. With the amendment of Claim 1, the (meth)acrylates of the present invention necessarily contain polyalkyleneglycol (meth)acrylate. Also, the Bremer resins are prepared by solution polymerization. Polymers of the present invention are prepared by mass polymerization. In addition, the example of an aqueous clear coat in Bremer has a content of organic solvents of about 18%. The maximum organic solvent content of the copolymers embodied in Claim 3 of the present invention is 10%. The objective of Bremer is to provide binders which can be used in solvent-borne as well as aqueous coating compositions. The instant invention relates to aqueous two-component coating compositions for automotive and industrial coatings based on hydroxy-functional acrylate copolymers and polyisocyanate cross-linking agents.

The second prong of the obviousness inquiry states that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings (See *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002)). Applicants respectfully submit that because the second prong of the obviousness inquiry is not satisfied by the Examiner's assertion, a *prima facie* case of obviousness is not established.

According to the Examiner, Bremer concerns cross-linkable aqueous compositions comprising hydroxyl-functional acrylic monomers. Campbell, according to the Examiner, has recognized the equivalence of various hydroxylated

acrylic monomers. Also, according to the Examiner, Campbell is in an analogous field of art and discloses the use of cross-linkable hydroxyl groups that may be derived from hydroxyethyl (meth)acrylate, hydroxybutyl (meth)acrylate, polyethylene glycol mono(meth)acrylate or polypropylene glycol mono(meth)acrylate. Thus, according to the Examiner, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include polyacrylate resins comprising a combination of hydroxyl functional acrylic monomers, including those claimed by the instant invention, in the coating composition of Bremer and thereby obtain the instant invention, absent a showing of unexpected results.

Applicants disagree with the Examiner's assertions above. Campbell teaches the use of *non-ionic* dispersions of acrylic resins to avoid instability of the coating composition in the presence of acids and bases and to avoid interference with the cure of melamine crosslinkers (col. 1, lines 48 – 51). In fact, Campbell differentiates its invention from anionic dispersions of its prior art (See col. 1, lines 40-51).<sup>3</sup> The acrylic resins of Campbell are free of carboxyl groups. Also, there is no indication to use polyalkylene glycol(meth)acrylate in *anionic acrylic resins* to improve the compatibility with non-hydrophilic polyisocyanates. In other words, there is no motivation or suggestion to combine Bremer with Campbell.

Therefore, Applicants respectfully submit that the Examiner has not met his burden of proof in establishing a *prima facie* case of obviousness.

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<sup>3</sup> See footnote 1, *supra*.

**SUMMARY**

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. In order to expedite disposition of this case, the Examiner is invited to contact Applicants' representative at the telephone number below to resolve any remaining issues. Please charge any fee due which is not accounted for to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company).

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Hilmar L. Fricke", written over a horizontal line.

Hilmar L. Fricke  
Reg. No. 22,384  
Attorney for Applicants  
Phone: (302) 984-6058  
Facsimile: (302) 658-1192

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